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## The President's New Year Message

THE Editor has invited me to contribute this New Year message and I am indeed privileged and proud to have this opportunity, on behalf of the Officers, of saying " A Very Happy New Year " to all members of the British Veterinary Association both overseas and at home. May every one of us be able to look back when 1956 comes to its close on a year of useful work well done. And not only on a year of work well done, but also on a year in which our personal relations with our professional colleagues have been drawn closer—so making life more worth living.

May I wish our overseas members a very special " Happy New Year?" Our thoughts are very much with those of you who look upon these Islands as " Home."

I can assure all of you that the Overseas Committee—your Committee—is very zealous in pursuing all matters relating to your welfare. I have, on numerous occasions, been impressed by the time and trouble taken on your behalf. May I, in this New Year message, ask each one of you not to neglect calling at, or at least writing to, No. 7, Mansfield Street, when in Britain on leave. The Overseas Committee want all the information and assistance on such things as your conditions of service as they can get. And I can also assure you that Mr. Knight and his staff take especial pleasure in greeting you at the B.V.A.'s new Town House!

Our Association has many problems to face. One sometimes feels dispirited when contemplating our present position in the community. We know that we ought to be made more use of in quite a number of fields of human activity and many of us often feel that we are not getting a square deal from some other bodies in the land. Nevertheless, I am quite sure that we have only to keep on keeping on in our endeavours to prove to our fellow men that our contentions are good and proper.

At the present time, when the correspondence columns of THE RECORD carry so much discussion on " Public Relations," may I assure all of you that the Officers are well aware of our shortcomings in this matter; that everything possible will be done to improve our standing in the community and that whenever possible that same community will be informed of our profession's point of view. However, quite a lot of work is being done already but much of it cannot, by its very nature, be made freely known to all of you.

There are, of course, difficulties in implementing some of our more important ideas, such as the appointment of a Public Relations Veterinary Officer —but we feel that the next few years will see a very great improvement in these matters. Perhaps the best " P.R. Officer " is each one of us—whether teaching, in research, in the State or municipal service or in general veterinary practice. If we, all of us, give service to our fellows—and to the animals that depend on us—it is certain that many, if not all of our wishes will be more easily fulfilled.

Before closing may I thank the Council of the R.C.V.S. as well as their staff at Red Lion Square for the excellent liaison which exists between them and us. Our relations are such as should exist between " close friends," and, as we all know, close friends can also be candid friends when discussing some matter of common interest.

May I, therefore, ladies and gentlemen, wish all of our members a " Happy New Year," and may our work bring us, in 1956, those things which are best.

EDWARD WILKINSON.

# Eosinophilic Myositis in Dogs

BY

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THIS condition has been recognised as a clinical entity since 1940 when it was described by Kuscher in Vienna. Since then it has been reported from Holland, Scandinavia, France, Germany, the United States of America, and during a period of 15 months, four cases have been examined in the Pathology Department here.

Hebrant & Liégeois (1928) and Robin & Brion (1934) have reported a number of cases which were possibly eosinophilic myositis. (Their cases showed no breed susceptibility.) The Alsatian is the breed which is usually affected, although cases have been reported in the Miniature Poodle (Otten, 1952), St. Bernard (Erichsen, 1952) and the Japanese Chin dog (Verlinde & Winsser, 1946). The majority of cases have been diagnosed clinically without pathological confirmation.

## Symptoms

The disease involves the muscles of mastication, masseters, temporals and pterygoids, although Verlinde & Winsser reported one case in which those of the upper arm were affected. Darman & Sikar (1952) recorded one case in an Alsatian where both hind limbs were involved with no head lesions. The mastication muscles show a bilateral enlargement which increases the width of the head to give the subject a "foxy" appearance and they become extremely hard. Opinions differ as to whether or not the condition is painful. Kuscher (1940) states that no pain or heat was present while Ullrich (1950) found that his cases were in pain. The affected animal is unable to open or close its mouth properly and holds it partly open in a state of pseudotrismus. In the early stages, the muscular enlargement may be unilateral but the opposite side soon becomes affected (Bassett, 1954). These lesions make it difficult for the dog to eat and it may go off its food and become debilitated.

As the orbital ring of the dog is incomplete, the swelling of the temporal muscles results in an increased pressure on the retrobulbar fat, which forces the eye forward causing an exophthalmos. The eyelids are also under pressure and as this makes it difficult to close the lids, the cornea tends to "dry-off" and it may become inflamed and ulcerated. The mucous membranes become reddened and there is invariably protrusion of the membrana nictitans, sometimes complicated by prolapse of its gland. The appearance of the bulbus suggests a glaucoma but there is no apparent increase in the intra-ocular pressure.

Dogs with eosinophilic myositis may show a tonsillitis and enlarged mandibular lymph nodes. The acute phase will last two to three weeks, the symptoms reaching a peak in 10 to 14 days. There may be a rise in temperature. Wirth (1941) observed that an acute phase was preceded by polyuria. Each attack brings about a degree of atrophy of the temporal and masseter muscles and is apt to be followed, at progressively shorter intervals, by other attacks, which lead to further atrophy and impaired efficiency of the muscles of mastication. Wirth has observed temporal atrophy in dogs with no history of symptoms and suggested that the disease occurs in a sub-clinical form.

## Diagnosis

The symptoms are unmistakable but the diagnosis can be confirmed by examination of a blood smear. A differential count will show 13 to 63 per cent. eosinophils (most cases ranging between 20 to 30 per cent.). The eosinophilia may increase during the recovery phase of an attack.

## *Post-mortem* Lesions

Kuscher destroyed a previously unaffected dog during the acute phase of the disease. The incised masticatory muscles showed greyish-red streaks, scattered yellowish areas and areas of haemorrhage. There was a tonsillitis and the mandibular lymph nodes were enlarged and congested. The affected muscles showed an interstitial infiltration by numerous mature eosinophils. Generally, the muscle striations persisted but some fibres showed atrophy which was attributed to pressure by the cellular infiltration.

Erichsen found a considerable amount of fibrous tissue separating normal muscle fibres. There was no evidence of muscle degeneration but there was an infiltration by lymphocytes, plasma cells, histiocytes and a few eosinophils.

Winter & Stephenson (1952) recorded a case in a two-year-old Alsatian dog which showed macroscopic lesions akin to those described by Kuscher. The infiltrating cells consisted of an equal mixture of eosinophils and mononuclears. In the haemorrhagic areas numerous macrophages laden with haemosiderin were observed. The majority of the muscle fibres showed striations though some were homogeneous. A proportion of the fibres showed a nuclear proliferation which suggested a muscular regeneration. The mandibular lymph nodes were congested with considerable accumulations of haemosiderin. The tonsillar epithelium was eroded and infiltrated with lymphocytes, and numerous neutrophils were present in the substance of the gland. Although Kuscher sectioned muscles from the tongue, oesophagus, heart, limbs and eye, and Winter & Stephenson examined muscle from the face and eye, no similar lesions were found.

It would seem that Kuscher's case was sacrificed in the early stages of the first attack and it is considered to be an example of the early stages of the disease. Erichsen's case may be regarded as terminal and Winter & Stephenson's case as intermediate between the two.

FIG. 1.—A four-year-old Alsatian (Case 4) showing the typical appearance of the acute phase of the disease. Note the pseudotrismus.

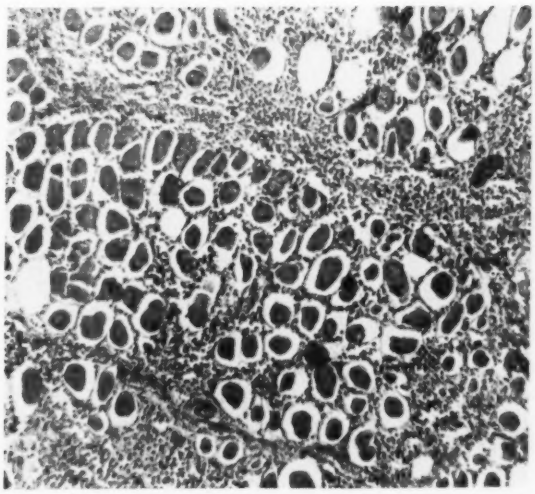

FIG. 2.—Section from the temporal muscle of a four-year-old Alsatian dog (Case 2). Note the widening of the perimysium and the intense but variable cellular infiltration throughout the field. Some of the muscle fibres are atrophic. H & E × 100.

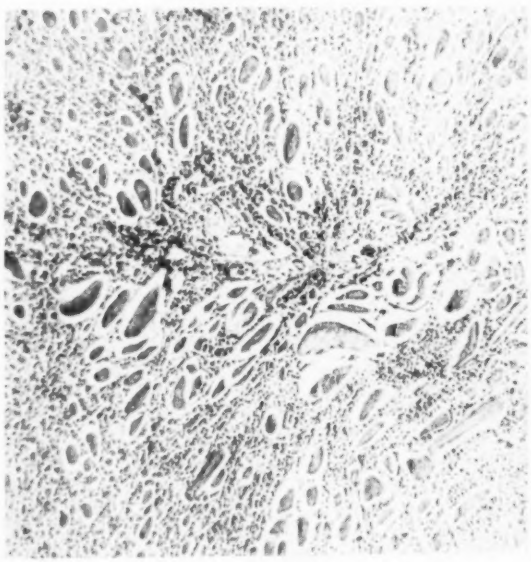

FIG. 3.—Section from the oesophagus of a seven-year-old Alsatian bitch (Case 3). Note the cellular infiltration which is concentrated around the capillaries. H & E × 100.

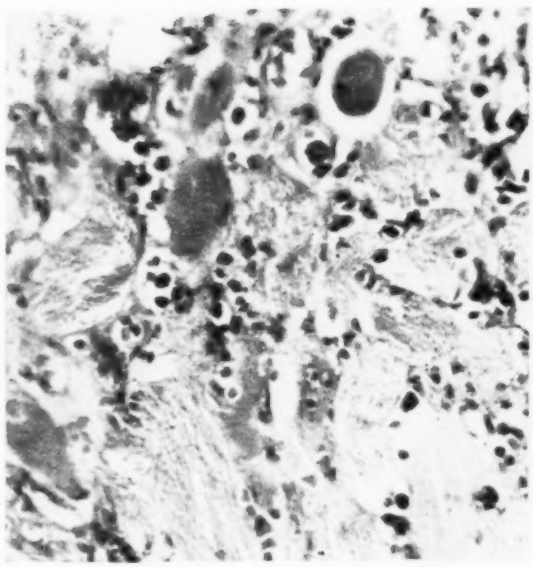

FIG. 4.—Section from the temporal muscle of the same bitch (see Fig. 3). Note the extensive muscle degeneration, the persistence of striations in some fibres and the cellular infiltration. H & E × 250.

### Treatment

Various methods of treatment have been applied to this condition ranging from massage, heat and liniments to the anti-histaminic drugs and short-wave therapy. None of these forms of treatment seem to alter the course of the disease.

Moon & Wood (1954) treated a case with repeated doses of cortisone over a period of 13 days. The animal was normal at the end of the course apart from some atrophy of the temporal muscles. A blood smear prior to treatment showed 22.5 per cent. eosinophils, reduced after treatment to 13 per cent. eosinophils.

### Report of Cases

*Case* 1.

A nine-year-old Alsatian dog was destroyed with a suspected intervertebral disc lesion and a pachymeningitis. There were no symptoms other than a posterior paralysis. Eosinophilic myositis was not suspected and the blood was not examined.

Post-mortem *examination*.—The temporal and masseter muscles on incision showed fine greyish-red streaks with patchy yellow areas scattered between them. The lymph nodes were not examined.

*Histology*.—The lesions in the temporal muscle were patchy in their distribution but conformed to those described by Kuscher. There was no marked muscle degeneration and all the fibres retained their striations. The majority of the eosinophils present were segmented. No *Sarcosporidia* or *Trichinella* were observed.

*Case* 2.

A four-year-old Alsatian dog had shown intermittent protrusion of the eyes over a period of two years. Each attack lasted a few weeks and then subsided to recur at a later date. No diagnosis was made and the dog was subsequently destroyed, at the height of an attack. No blood examination was made.

Post-mortem *examination*.—There was a marked exophthalmos with congestion of the conjunctival mucous membranes and prolapse of the membrana nictitans. The muscles of mastication were hard and swollen. The lymph nodes of the head were enlarged. The muscles showed irregular streaks of dark reddish-brown and yellowish-grey colour.

*Histology*.—Sections of the mandibular lymph nodes and representative pieces of the affected muscle were stained by haematoxylin and eosin, by Giemsa and by the Van Gieson and prussian blue methods.

The lesions in the lymph nodes and muscles conformed to those described by Winter & Stephenson. The eosinophils varied in type from eosinophilic myelocytes to segmented eosinophils. The unstriped muscle of the arterioles was unaffected by the changes taking place in the adjacent striped muscle. No trichinella or sarcosporidia were observed.

*Case* 3.

A seven-year-old Alsatian bitch which was presented at the Beaumont Animals' Hospital on December 30th, 1954, had shown intermittent proptosis and swelling of the masseter and temporal muscles, with an associated swelling of the mandibular lymph nodes.

The attacks had lasted for two to three weeks and recurred at decreasing intervals every few months. During the earlier attacks penicillin had been injected.

On examination the bitch showed bilateral enlargement of the muscles of mastication associated with exophthalmos and prolapse of the membrana nictitans. She had difficulty in opening her mouth. Eosinophilic myositis was suspected, and confirmed by blood examination which showed 15 per cent. eosinophils upon a differential count.

A course of an anti-histaminic drug was given but did not have a lasting effect on the disease and the dog was destroyed at the owner's request on January 18th, 1955, when the acute symptoms had subsided.

*Post-mortem examination*.—The carcase was in fairly good condition. The temporal region was depressed due to muscle atrophy, but the masseter muscles appeared to be of normal size. On incision, the temporal and masseter muscles were dark mahogany-red in colour and showed scattered, irregular yellowish-white areas. No changes were observed in the main branches of the mandibular nerves. The eyes and the ocular muscles appeared normal.

The tonsils, retropharyngeal and mandibular lymph nodes were enlarged and haemorrhagic.

The oesophagus was dull red in colour and its wall was thickened. The whole length of the organ was dilated and the musculature, in section, was identical in appearance with the muscles of mastication. The smooth muscle of the stomach, and the large and small intestine showed no changes macroscopically and none were observed in the remainder of the carcase.

*Histology*.—Sections were taken from the temporal and masseter muscles, the oesophagus, the retropharyngeal and mandibular lymph nodes, the mandibular nerve, the stomach and the muscles of the face and forearm.

The changes in the lymph nodes were similar to those in Case 2.

The stratified squamous epithelium and glands of the oesophagus were normal. The deeper layers of the tunica propria were markedly oedematous and the normal folding of the mucosa was not present. Dilated capillaries were seen in the oedematous region and a number of eosinophils which had infiltrated into the region from the affected muscles beneath. The muscularis was heavily infiltrated with eosinophils, mature and immature, together with lymphocytes and some plasma cells, and its fibres were widely separated. The fibres retained their striations though in some cases the sarcoplasm appeared rather granular. The vessels were congested but there was little haemorrhage and little haemosiderin. The adventitia was oedematous and contained some congested capillaries and an infiltration of eosinophils from the adjacent muscle coat. There was no fibrosis.

The changes in the mastication muscles were similar to those described by Winter & Stephenson although the changes were more pronounced

than those they described. The sarcoplasm was fragmented, losing its affinity for eosin and staining a pale pink colour. The fragmentation was longitudinal, the fibres tending to break up into their component myofibrils. (See Fig. 4.)

No changes were observed in the mandibular nerve or any of its main branches.

The unstriped muscle of the stomach showed no changes and there were no changes in the muscle of face or forearm. No *Trichinella* or *Sarcosporidia* were observed.

*Case* 4.

A four-year-old Alsatian dog which was presented at the Beaumont Animals' Hospital on April 21st, 1955. In 1953 the dog had a "growth" removed from the right eye, which had caused a bilateral conjunctivitis; the inflammation subsided in one week. In January, 1955, the owner observed that the dog was "twitching" in both hind limbs; these symptoms persisted for three to four days. In early April, 1955, the dog showed another "growth" on the third eyelid with a swelling in the "middle" of the head. This was accompanied by a bilateral conjunctivitis and glaucoma and later by swelling of the masseter muscles and the soft palate. The dog was more excitable than usual and, although he could drink water, he found it difficult to eat; this acute phase was of over a month's duration.

On examination the animal showed a bilateral enlargement of the temporal and masseter muscles and enlargement of the mandibular lymph nodes. The tonsils were not enlarged.

The muscles were very hard but did not appear to be painful and no difficulty was experienced in opening the mouth to a limited degree. When at rest the mouth was held in pseudotrismus.

The eyes were protruded and the mucous membranes were inflamed. The left eye was more markedly affected. There was no photophobia (see Fig. 1). No other symptoms were evident.

Eosinophilic myositis was suspected and confirmed by blood examination which showed 39 per cent. eosinophils. The white cell count was 26,000 on the first examination but was within the normal range subsequently.

Swabs from the tonsils produced no significant growth of organisms.

A course of ACTH was administered at a rate of 20 I.U. intramuscularly every 48 hours for 8 days. After the first injection there was depression and lassitude which was relieved in 24 hours. After the second injection the dog was much brighter and wanted to play, the muscles softened and began to reduce in size. The improvement continued and the appetite returned. Within 10 days the dog had returned to normal; the only legacy of the attack was a marked temporal and masseter atrophy. The mouth could be fully opened without any difficulty or discomfort. The mandibular lymph nodes were not enlarged. The atrophy of the muscles resulted in a retraction of the eyes into the orbit and a resultant entropion. A further blood sample was examined and showed 14 per cent. eosinophils.

A second course of ACTH was undertaken on the same lines as the first. At the end of this course there was no significant change in the clinical condition, the improvement having been maintained. A further blood sample showed that the eosinophilia was reduced to 2 per cent.

The leucocytosis present at the first examination could not be explained by any intercurrent infection. The anaemia and increased sedimentation rate seen at the first examination were not observed subsequently.

## Discussion

The aetiology of this condition remains unknown. The fact that the predominant cell is an eosinophil might suggest the possibility that the condition is parasitic in origin, yet no *Trichinella* or *Sarcosporidia* have been observed, although both these parasites have been reported as occurring in the dog. Ullrich suggested that the condition is an allergy, but it does not respond to antihistaminic drugs. Robin & Brion, supported by Douville (1950), regarded the condition as traumatic in origin. Erichsen suggested that there are changes in the mandibular nerve, which supplies the muscles of mastication. Although cases have been reported involving muscles other than the muscles of mastication, these exceptions do not invalidate Erichsen's theory. The mandibular nerve and its main branches were examined in Case 3 but no changes were observed. Obviously further cases must be examined but it seems doubtful that such an advanced case as this would not have shown lesions if Erichsen's theory were correct.

Kuscher found only mature eosinophils in his case but in three cases reported in this paper both mature and immature eosinophils were present. The immature cells seemed to outnumber the mature cells in Cases 2 and 3.

Wirth suggested that the condition may occur in a subclinical form. This observation would seem to be supported by the history and histology in Case 1. The cases reported by Hebrant & Liégeois and Robin & Brion may have been subclinical cases but there was no breed susceptibility and no periodicity of acute symptoms. The condition, in the majority of their cases, was essentially a progressive atrophy of the temporal and masseter muscles over a number of weeks. This condition has been observed in the British Isles and is known by clinicians as "Trismus" or atrophic myositis.

It is significant that the condition seems to be confined to voluntary muscle. The unstriped muscle of the arterioles and stomach (in Case 3) showed no changes even when in close proximity to the affected voluntary muscles.

The involvement of the oesophagus (in Case 3) has not been recorded previously. Kuscher examined sections of this organ from his case but found no lesions.

Case 4 is a typical one which was treated, in the acute phase, with ACTH and appeared to respond well. However, the condition may have regressed spontaneously and thus the efficacy of the treatment is in doubt.

At least six months should elapse in this case before the true value of this treatment can be assessed.

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# Tuberculin Sensitivity in a Sample of Attested Herds

BY

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"Surveys cannot be regarded as satisfactory substitutes for experiments. Nevertheless, they are of value in situations in which experiments are difficult or impossible, though in such cases all conclusions must be tentative. They are also of value as a preliminary to experimental work, since they frequently indicate the factors that are likely to be most worth investigation."

F. Yates,

*Sampling Methods for Censuses and Surveys* (1949)

THE sensitivity of tuberculosis-free cattle to tuberculin is a matter of interest to those engaged in any aspect of tuberculosis eradication or research, but despite the vast amount of both experimental and routine data in the files of the Animal Health Division and the wide personal experience of many veterinarians, there is a paucity of information lending itself to ready reference. There is abundant literature on a variety of known causes of so-called non-specific sensitisation, but little indicating the amount which occurs, or its distribution. The present investigation sets out to determine if this deficiency can be remedied using data already in existence, and if, subsequently, more extensive, statistically planned surveys could be expected to yield useful information. The quantitative value of such a survey is increased by the application of a reasonably uniform tuberculin-testing technique and by the use of PPD tuberculins of constant strength in all official tests.

The objectives of the survey may be stated in more precise detail as :—

(1) To estimate the incidence of non-specific sensitisation in attested herds in a single county : Berkshire.

(2) To determine and compare the patterns of reactivity to avian and mammalian PPD tuberculins.

(3) To arrange the data in such a way as to indicate possible correlations with age, altitude, area, sex, breed and proximity to woodland.

(4) To compare the arranged data of two successive years on the same sample of herds.

(5) To provide information for correlation with surveys of different type, *e.g.*, on Johne's disease, skin tuberculosis, etc., and which can be compared with other areas in this country and abroad. The data should also provide a factual basis for hypothesis and planning of experiments.

## Methods

1. *Tuberculin tests* were all carried out by the single intradermal comparative method (M. A. F., 1942) ; that is, by simultaneous inoculation of avian and mammalian tuberculin, each in a dose of 0·1 ml., into two adjacent sites in the side of the neck. The double thickness of a fold of skin at the injection sites was measured before and 72 hours after inoculation—the difference between these measurements expressed in millimetres constituted the degree of reaction. The tuberculins used were mammalian (human) PPD at 2·0 mg. per ml. and avian PPD at 0·5 mg. per ml.

2. *Sampling.*—One hundred herds were selected from the Register of Attested Herds. Milking herds of this type in Berkshire were divided into five groups on the basis of the number of animals in the herd at the time of the 1954 test. Herd samples were then taken from each group by a random procedure in numbers pro-

## Summary

The literature regarding eosinophilic myositis is reviewed and four further cases, all affecting Alsatians, are recorded, in one of which the oesophagus was involved as well as the masticatory muscles.

The mandibular nerve was examined in one case; no lesions were observed.

One case was treated with ACTH and responded well. Great caution attends the prognosis.

*Acknowledgments.*—Thanks are due to Mr. F. Drury for his assistance with the dissection of the mandibular nerves in Case 3; to Mr. G. C. Knight for his co-operation in Cases 3 and 4, and to Mr. S. S. Nye of Romford in Case 4; to Mr. F. Shepherd for the photograph and microphotographs, and Mr. G. W. Swayne for the preparation of the sections.

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portional to the number of herds in the group concerned, as shown in Table I, *i.e.*, a variable sampling fraction was taken (Yates, 1949).

TABLE I
SELECTION OF SAMPLE

| Group | Number of animals in herd | Number of herds | Number of herds selected for sample |
|---|---|---|---|
| 1 | 1– 10 | 47 | 1 |
| 2 | 11– 30 | 163 | 17 |
| 3 | 31– 50 | 146 | 19 |
| 4 | 51–100 | 211 | 38 |
| 5 | Over 100 | 154 | 25 |

Two herds in Group 4 recently moved into Berkshire were replaced by further selection with indigenous herds. A similar procedure was followed with a herd vaccinated against Johne's disease.

8. *Data collected.*—The following information for the years 1953 and 1954 was transferred from the individual herd files to a single book.

(1) Name and address of owner.

(2) Number of herd tests since herd established as attested.

(3) If non-specific sensitisation in the official sense established.

(4) Date of test.

(5) Name of tester.

(6) Number of animals in herd.

(7) Breed or breeds of animals in herd.

(8) For each individual animal :—
Age.
Sex (1954 only).
Reaction to avian tuberculin — mm. increase.
Reaction to mammalian tuberculin—mm. increase.

(9) Animals for retest, those showing skin lesions, symptoms of Johne's disease, or vaccinated against Johne's disease.

As far as possible the test selected for 1953 was separated by a period of 12 months from that in 1954.

## Definitions

In carrying out the various arrangements some rules had to be introduced on the rejection or inclusion of animals or herds, and some of the terms required precise definition. The processes and definitions are in part arbitrary but may aid comparison of the data with that prepared by others.

*Non-specific sensitisation.*—Sensitisation which produces reactions to mammalian tuberculin in the absence of bovine tuberculosis.

*Herd.*—A group of cattle belonging to one owner. All cattle grouped on one file constituted a herd even if on separate contiguous farms. Cattle with one owner but on separate files were considered as more than one herd.

*Calf.*—An animal under 10 months of age.

*Adult.*—An animal of 10 months of age or over.

*Skin tuberculosis.*—An animal considered affected if described as " Skin TB." or " Skin lesions."

*In woods.*—The farm situated in or near a green area on the 1 in. to 1 mile Ordnance Survey Map.

*Near woods.*—Situated between ½ and 1 mile from a green area.

*Not near woods.*—Situated over 1 mile from a green area.

*Breed.*—A herd consisting of all, or almost all, animals of one breed was classified under that particular breed. All other herds were considered to be mixed breeds or consist of cross-bred animals.

*Attested herd.*—A herd which is on the Register of Attested Herds. The data are taken from the first or later tests after attestation. Herds on " Capitation bonus " were not included in the sample.

*Altitude.*—The height above sea-level as shown by the 1 in. to 1 mile Ordnance Survey Map. If midway between contour lines, the altitude was taken as the higher.

*Reactor.*—An animal classified for removal at an official test was not included in the sample and the test results of the herd at the subsequent confirmatory test were used.

*Inconclusive Reactors.*—These were included.

*Johne's disease.*—Animals stated as suspect Johne's disease were not included.

*Johne vaccinated.*—Vaccinated animals or herds were not included.

## Results

### 1. Mean Reactions to Avian and Mammalian Tuberculin

In a preliminary survey of the data, the mean reactions of each herd, and of the calves and adults in each herd were determined for the successive years 1953 and 1954. The statistics shown in Table II were calculated, no significant difference being found in the mean reactions between corresponding groups in the two years.

TABLE II
MEAN REACTION TO AVIAN AND MAMMALIAN TUBERCULINS

| | 1953 | | | | 1954 | | | |
|---|---|---|---|---|---|---|---|---|
| | Adults | | Calves | | Adults | | Calves | |
| | Avian PPD | Mammalian PPD | Avian PPD | Mammalian PPD | Avian PPD | Mammalian PPD | Avian PPD | Mammalian PPD |
| Mean reaction (mm.) | 2·078 | 1·180 | 0·496 | 0·327 | 2·321 | 1·126 | 0·685 | 0·346 |
| Standard deviation... | 0·9713 | 0·6944 | 0·6286 | 0·404 | 1·184 | 0·6951 | 1·1515 | 0·5197 |
| Standard error ... | 0·09713 | 0·06944 | 0·0645 | 0·04145 | 0·1184 | 0·0695 | 0·1157 | 0·0522 |
| Range (mm.) ... | 0·2–4·9 | 0·1–3·1 | 0–2·7 | 0–1·4 | 0·2–6·4 | 0–3·9 | 0–6·3 | 0–3·2 |
| Number of herds ... | 100 | | 95 | | 100 | | 99 | |

A marked difference was evident between the reactivity of calves and adults to both types of tuberculin, and in both these groups the difference in mean reaction between the avian and mammalian tuberculins was significant. The means for adults were normally distributed, but those for calves showed only the right-hand half of the normal frequency distribution curve ; the herd means as a whole decreased gradually with increasing size of herd.

A high positive correlation was found between the mean reactions of herds in the two successive years ($r = +0{\cdot}52$, $t = 6{\cdot}03$, significant at $P_{0{\cdot}001}$) suggesting that the mean reactivity of herds does not fluctuate widely from year to year. A higher correlation existed between the means of herds tested by the same individual (44 herds, $r = +0{\cdot}725$, $t = 6{\cdot}8$, significant at $P_{0{\cdot}001}$) than between means of those tested by a different individual (56 herds, $r = +0{\cdot}425$, $t = 3{\cdot}45$, significant at $P_{0{\cdot}001}$). Such a difference in correlation coefficients is significant ($P_{0{\cdot}03}$) but must be interpreted with caution. On the one hand it suggests personal bias, but it might equally well suggest consistency in technique.

Little further information was extracted from this summary of the data, but the means should prove useful for comparison with other samples.

*2. Frequency Distribution of Reactions*

Figs. 1 and 2 show the percentage of the entire sample showing 0, 1, 2 mm., etc., responses to avian and mammalian tuberculins in 1953 and 1954. The patterns are essentially similar. Histograms of this type have been prepared from human populations composed chiefly of schoolchildren, and the pattern shown to differ in various countries of the world. After rejection of highly allergic tuberculous individuals, histograms of the reactions to high doses of tuberculin (100 T.U.) led the Tuberculosis Research Office of WHO to believe that a low grade tuberculin sensitivity exists independently of that produced by tuberculosis and that it is associated with geographical factors. The pattern shown here for mammalian tuberculin is very similar to that given by T.R.O. for English and Danish schoolchildren (WHO, 1955) but markedly different from that given for the Sudan. Drawing a close parallel is difficult because of the differences in age range, in the criteria of freedom from tuberculosis, and in the capacity of the human and bovine subject to develop tuberculin sensitivity ; also the usual dose of PPD tuberculin in cattle is 1,000 times greater than the 10 T.U. dose in the human. In order to meet the difficulty of interpreting non-specific reactions, T.R.O. tentatively suggest that the reaction level considered indicative of tuberculosis should be

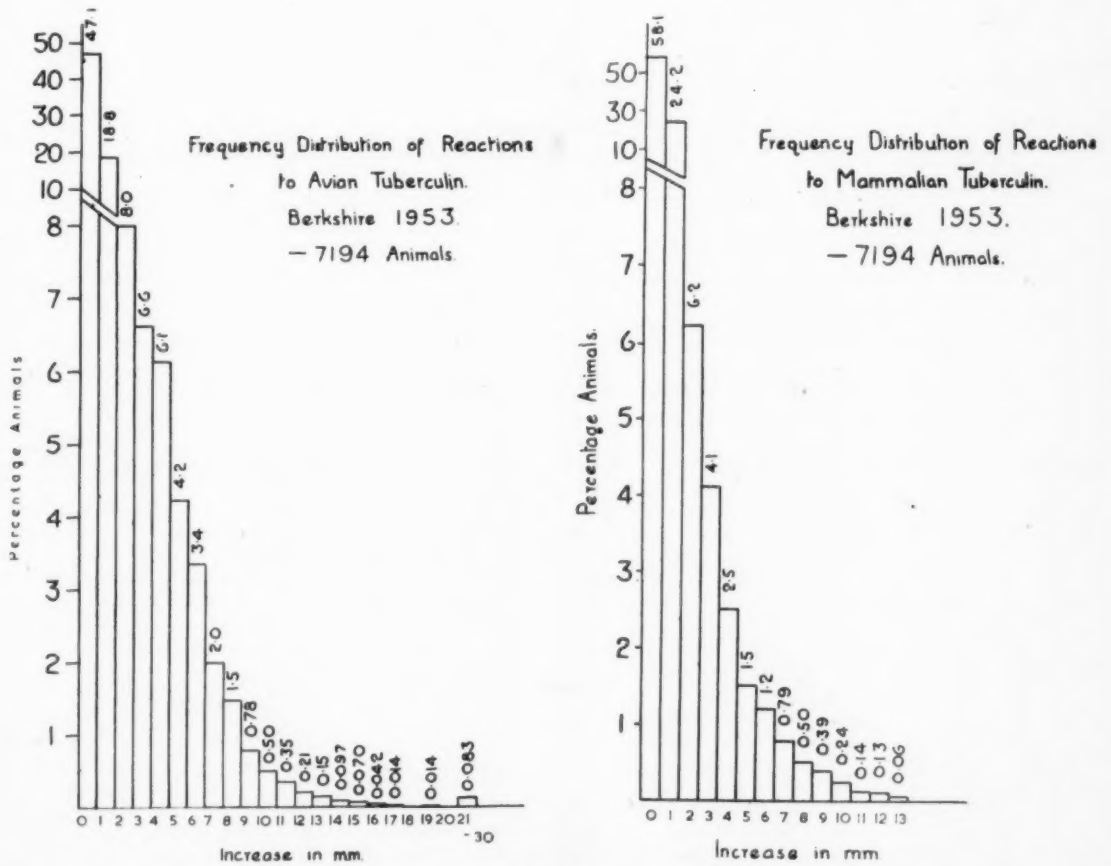


FIG. 1.

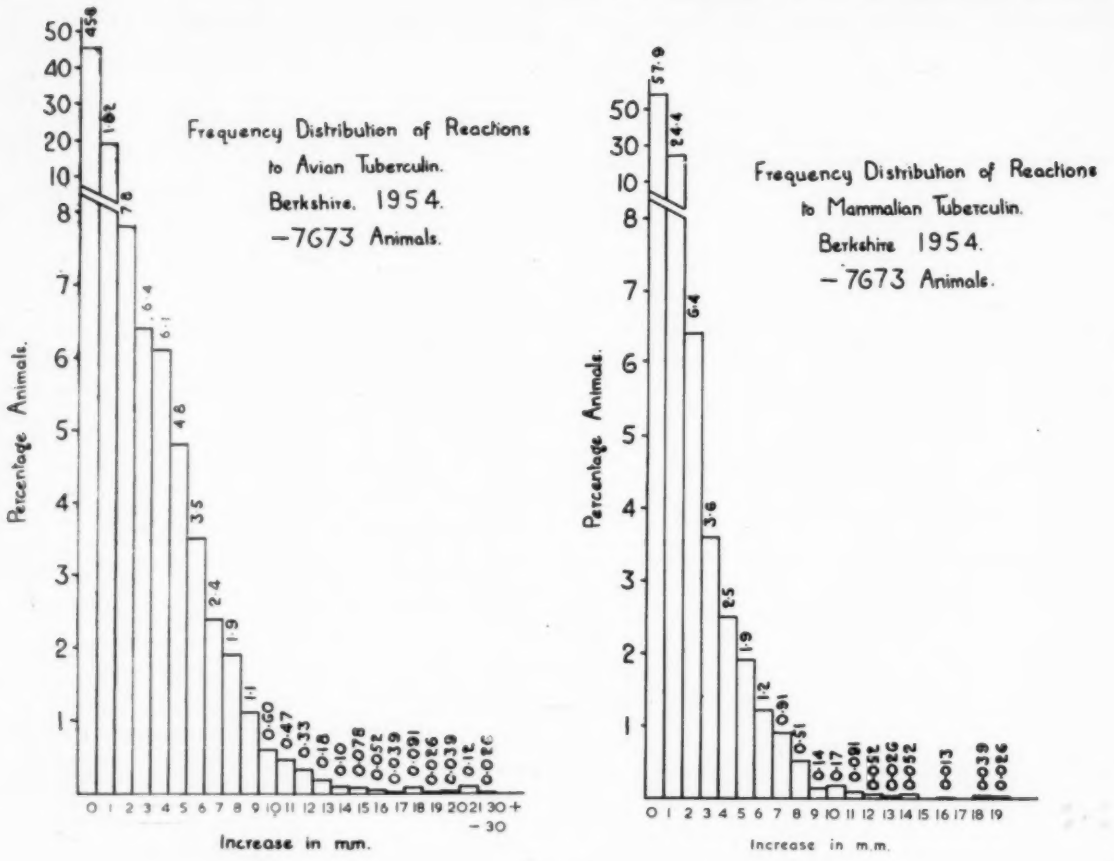


FIG. 2.

varied in different geographical areas. This problem in veterinary practice produced the use of avian tuberculin as an index of the non-specific sensitivity of the individual animal and herd.

If it is assumed that an increase in skin thickness of 2 mm. or over constitutes a reaction, then by summing the relevant areas under the curves for 1954, 36 per cent. of all animals reacted to avian and 17·7 per cent. to mammalian tuberculin. Even with such a strict definition of a reactor, the incidence was not as high as might have been expected. Since approximately one-sixth to one-fifth of all animals are calves with a low degree of reaction to tuberculin, the percentage of adult animals showing reactivity to avian and mammalian tuberculin was about 43 and 21 per cent. respectively.

The similarity of form in the avian and mammalian histograms suggested, but not inevitably, that both tuberculins were demonstrating the presence of the same sensitising agent. An elevation in either histogram on the right-hand side would suggest the presence of a sensitisation different from that in the present sample ; if the mammalian rise were greater than the avian, then specific, tuberculous sensitisation would, of course, be suspected, but if the reverse, then a different type or grade of sensitisation from that in the sample would be indicated. In addition, histograms were prepared for each year of age, and, to permit comparison with the T.R.O. figures, from a population composed of animals up to three years of age. All displayed a similar form to that derived from the entire sample.

### 3. *Reactions of Age Groups*

The mean reactions of all animals arranged according to age are shown in Figs. 3 and 4, which show a striking increase from birth to the age of three to four years, followed by a marked drop to the age of six to seven years. From eight years onwards the numbers of animals in each age group are small and it is not known how much confidence can be attached to the determined means. Table III shows the mean, the number of animals and the standard deviation of the variates determined for each tuberculin for each year of age. These statistics were used to determine the significance between corresponding points on the avian and mammalian curves, and between the various levels of the same curve. The difference between the avian and the mammalian reaction means is significant at all ages ($P_{0·01}$) but until the maximum is reached the rate of increase of reaction to avian tuberculin is greater than that to mammalian. The drop in sensitivity after the three-year-old peak would seem, unlike the low sensitivity of the calf region, to represent a real drop in capacity to react, as presumably the sensitising agent is

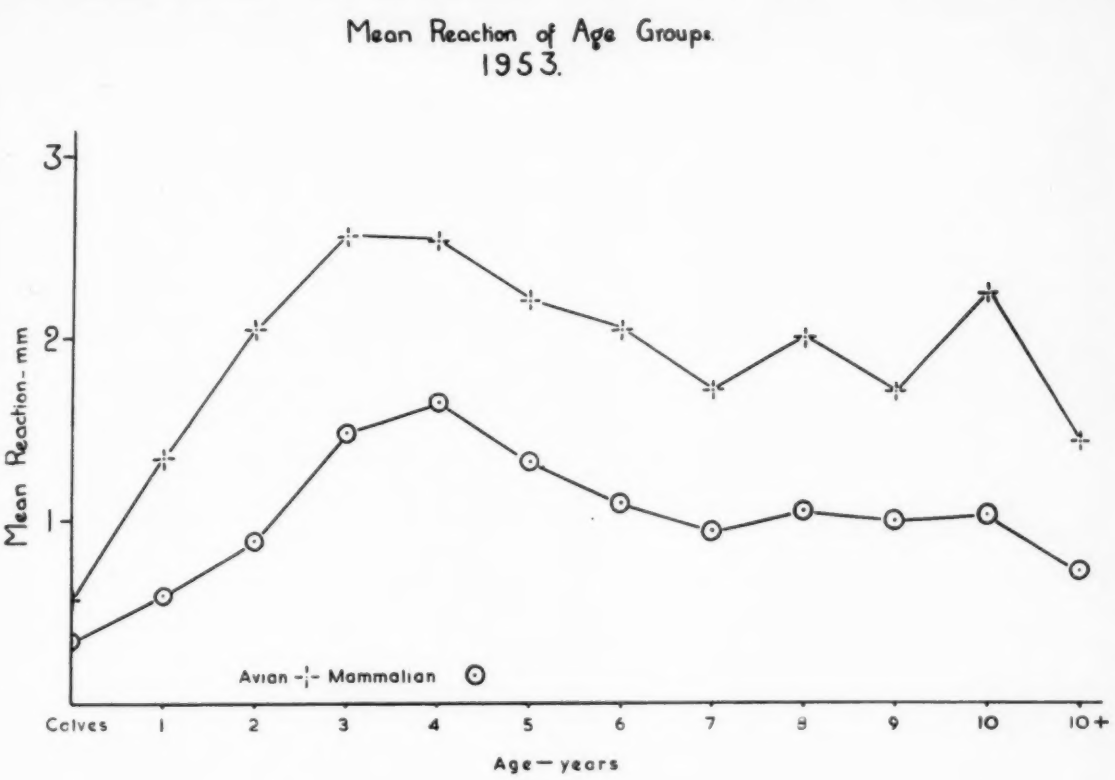


FIG. 3.

still present in the internal or external environment. The form of the curves may be influenced by many factors such as sex, altitude, proximity to swine and poultry, wild birds, etc., but even if produced by multiple causes, they constitute a basis for comparison both in form and level with similar curves prepared for other areas, with those prepared for animals kept under conditions where one or more of the influencing factors are kept constant, or with curves showing the incidence of other conditions at various ages, *e.g.*, Johne's disease or lungworm infection. Other comparisons which come to mind are the effect of age on the frequency of recovery of avian tubercle bacilli.

*4. Reactivity in Cases of Skin Tuberculosis*

Figs. 5 and 6 demonstrate the reactivity to tuberculin

TABLE III
REACTIONS OF AGE GROUPS

| Age (years) | 1953—7,171 animals | | | | | 1954—7,662 animals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Number of animals | Reaction to Avian PPD | | Reaction to Mammalian PPD | | Number of animals | Reaction to Avian PPD | | Reaction to Mammalian PPD | |
| | | Mean | Standard deviation | Mean | Standard deviation | | Mean | Standard deviation | Mean | Standard deviation |
| Under 10 months | 1,339 | 0·553 | 1·56 | 0·337 | 0·77 | 1,429 | 0·736 | 2·26 | 0·332 | 0·88 |
| 1 | 1,273 | 1·329 | 2·63 | 0·578 | 1·27 | 1,454 | 1·649 | 3·08 | 0·615 | 1·27 |
| 2 | 994 | 2·036 | 2·86 | 0·892 | 1·75 | 1,155 | 2·367 | 3·31 | 1·067 | 1·93 |
| 3 | 789 | 2·560 | 2·90 | 1·482 | 2·21 | 660 | 2·921 | 3·26 | 1·444 | 2·30 |
| 4 | 730 | 2·532 | 2·58 | 1·648 | 2·24 | 684 | 2·684 | 2·74 | 1·386 | 2·07 |
| 5 | 625 | 2·200 | 2·42 | 1·320 | 2·01 | 664 | 2·232 | 2·43 | 1·351 | 2·13 |
| 6 | 446 | 2·036 | 2·38 | 1·090 | 1·67 | 521 | 2·058 | 2·39 | 1·202 | 1·79 |
| 7 | 374 | 1·709 | 2·17 | 0·944 | 1·67 | 343 | 2·224 | 2·51 | 1·143 | 1·74 |
| 8 | 251 | 1·996 | 2·35 | 1·060 | 1·73 | 308 | 1·808 | 2·32 | 0·867 | 1·55 |
| 9 | 132 | 1·705 | 2·08 | 1·000 | 1·75 | 183 | 1·585 | 2·26 | 0·738 | 1·55 |
| 10 | 110 | 2·236 | 2·41 | 1·027 | 1·52 | 118 | 2·373 | 3·23 | 1·110 | 1·97 |
| Over 10 | 108 | 1·426 | 2·32 | 0·731 | 1·50 | 143 | 2·231 | 2·51 | 0·951 | 1·30 |

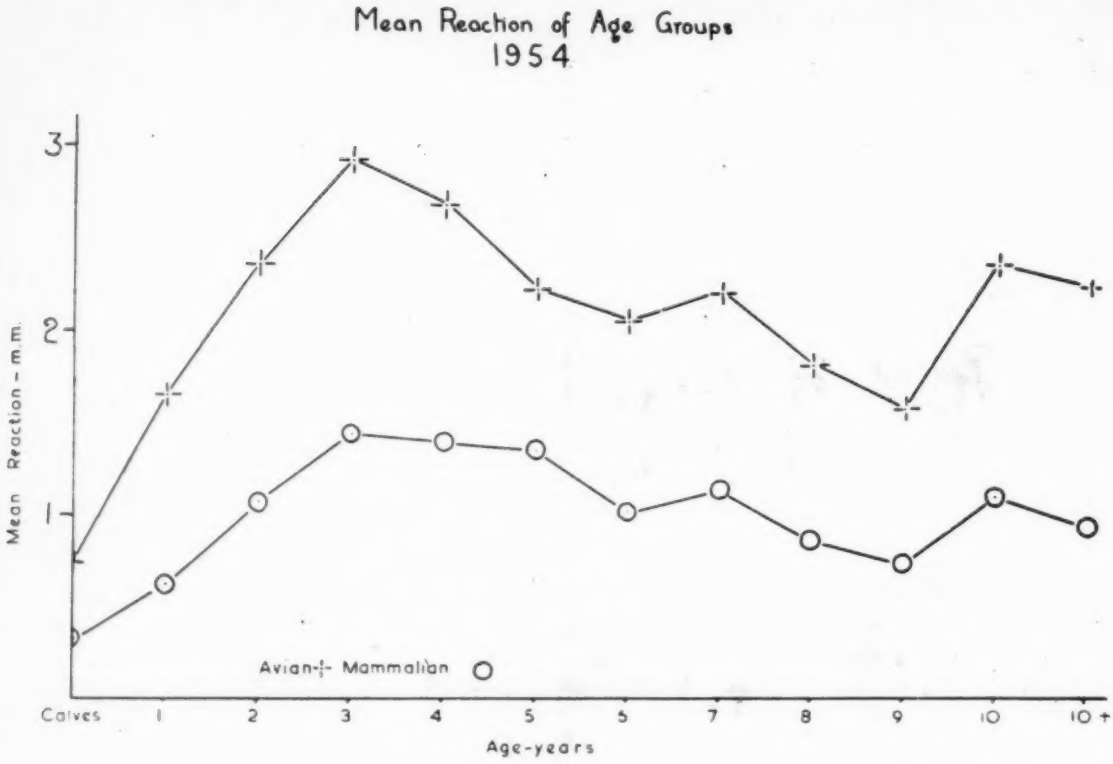


FIG. 4.

of animals stated to have skin tuberculosis. The mean reaction to mammalian tuberculin at all ages, except nine years, is greater than that to avian tuberculin. While the maximum reactivity occurs at two years, the maximum incidence of skin tuberculosis, as shown in Fig. 7, occurs at the age of four years and remains approximately constant with increasing age; no conversion from avian to mammalian excess or *vice versa* is evident at any age. The reactivity-incidence curves suggest that in these animals at least the exciting agent of skin tuberculosis is introduced early in life, and may explain the difficulty in obtaining culture in the case with well developed lesions. The data are highly subjective, as presumably peculiar tuberculin reactions lead to the search for skin lesions, but it would be almost impossible for observers to have any bias towards linking the level of reaction at two years with a maximum incidence at four to five years. Here again, it would be profitable to compare the patterns obtained with those for other regions and in larger samples. In 1953, 110 animals out of 7,194 had clinically diagnosed skin tuberculosis, *i.e.*, 1·53 per cent., the corresponding figures for 1954 being 92 out of 7,673 animals, *i.e.*, 1·12 per cent.

*5. The Mean Reaction of Bulls and Steers*

Up to the age of one year (Fig. 8) bulls increase in reactivity to avian tuberculin in the same way as steers or animals in general, but at two, three and four years a significant difference was found between the mean reaction of steers and bulls, and at three and four years between the mean reactions of all animals and bulls. Whether this difference is a true sex difference, perhaps arising from the considerable skin thickness in bulls, or one arising from the conditions under which bulls are maintained, *i.e.*, not permitted free access to pastures, it is not possible to state from the data presented. Mammalian tuberculin showed reactivity curves similar to, but at a lower level than, those of avian tuberculin. To obtain adequate numbers, bulls and steers were increased by inclusion of animals taken from a further random sample of 24 "milking" herds, making a total of 375 bulls and 365 steers. In determining the significance of the differences at the various ages, direct comparisons were made using the standard error of the relevant means.

*6. The Effect of Proximity of Herds to Woods and Trees*

It has been suggested that reactivity to avian tuberculin or non-specific reactivity to mammalian may be associated with the presence of wild birds (Smith, 1955); and Fig. 9, determined from the means of individual herds, shows the mean reactions of herds situated in, near or distant from wooded areas. There is certainly a tendency towards greater reactivity in wooded areas, but the downward slope can only be regarded as significant for the avian reactions in adult animals for 1953 ($P_{0.05}$). The direction of slope, however, is the same for all tuberculins, and in the two age groups, and suggests

**Mean Reaction of Animals with Skin Tuberculosis—1953**

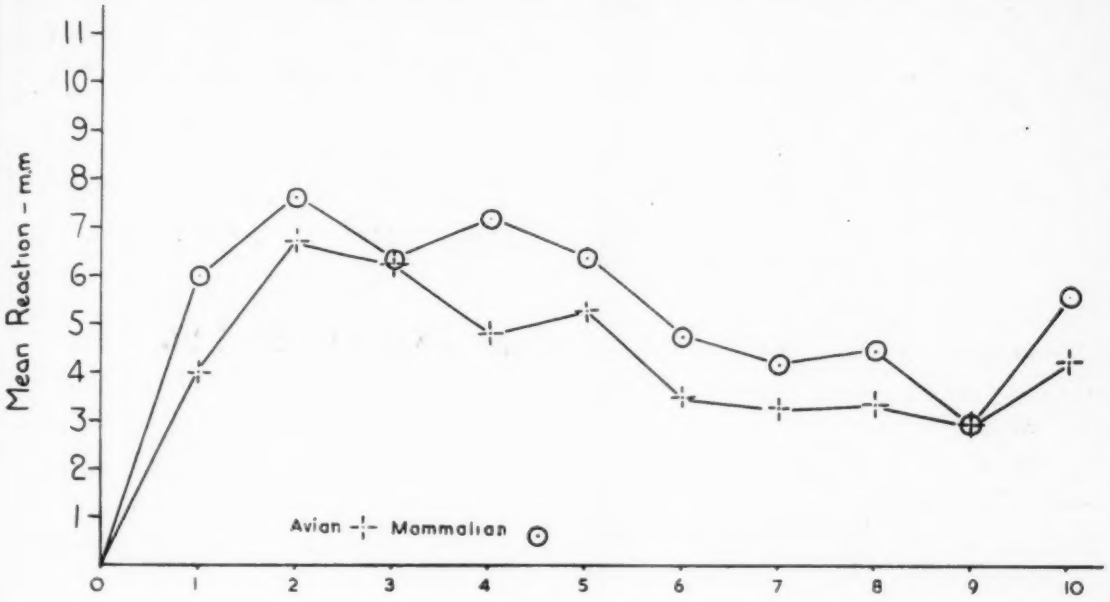


FIG. 5.

**Mean Reaction of Animals with Skin Tuberculosis—1954**

FIG. 6.

that the trend is a real one. To demonstrate the point unequivocally a much larger sample from the same or a comparable area is clearly required. In this, and in Sections 7, 8 and 9, each point on the curves represents the mean value of herd means ; the standard errors of these mean values were used to determine the significance of differences between the various reactivity levels.

*7. The Effect of Altitude on Reactivity*

The effect of altitude, again estimated as a mean of herd means, is shown in Fig. 10. The drop in reactivity between 200 and 400 ft. was significant and a clear trend was evident indicating that an increase in altitude was accompanied by a decrease in reactivity. As in the case of the preceding section, a much larger sample would be required to demonstrate the effect with any degree of certainty. An attempt was made to segregate the "woods and trees effect" from that of altitude, *i.e.*, to compare reactivity of "in woods" farms at different altitudes and so on, but the sample size again proved a limiting factor.

*8. The Effect of Breed on Reactivity*

The herds were grouped on the basis of breed, and exhibited a gradually decreasing order of reactivity more marked with avian than mammalian tuberculin in the order : Red Poll, Shorthorn, Friesian, Jersey, Ayrshire and Guernsey. The decrease was continuous in 1954 but irregular in 1953. None of the differences was found to be significant. The mean values for each breed were determined from 72 herds containing all, or almost all, of the same breed. The 28 remaining herds contained animals of different breeds or crosses of two breeds. The smaller herds tended to be composed of Jerseys and Guernseys ; the larger herds of Ayrshire.

*9. The Effect of Different Regions on Mean Values*

Berkshire was roughly divided into eight regions and these were found to fall in the order of decreasing reactivity to avian tuberculin : Windsor, Didcot, Abingdon, Reading and Wokingham, Wantage, Faringdon and Lambourn, Newbury and Maidenhead. The differences between these areas were clearly not significant, but it is of interest to note that Windsor is the most highly wooded.

*10. Comparison of Avian and Mammalian Reactions*

In manipulation of the data no official method of interpretation has been introduced, but it is of interest to know the frequency of occurrence of animals which give equal or almost equal reactions to both tuberculins. Such animals present a problem in interpretation, the possible solutions of which are beyond the scope of this article. All animals, of course, are acceptable on the official interpretation, but it is the animals in the

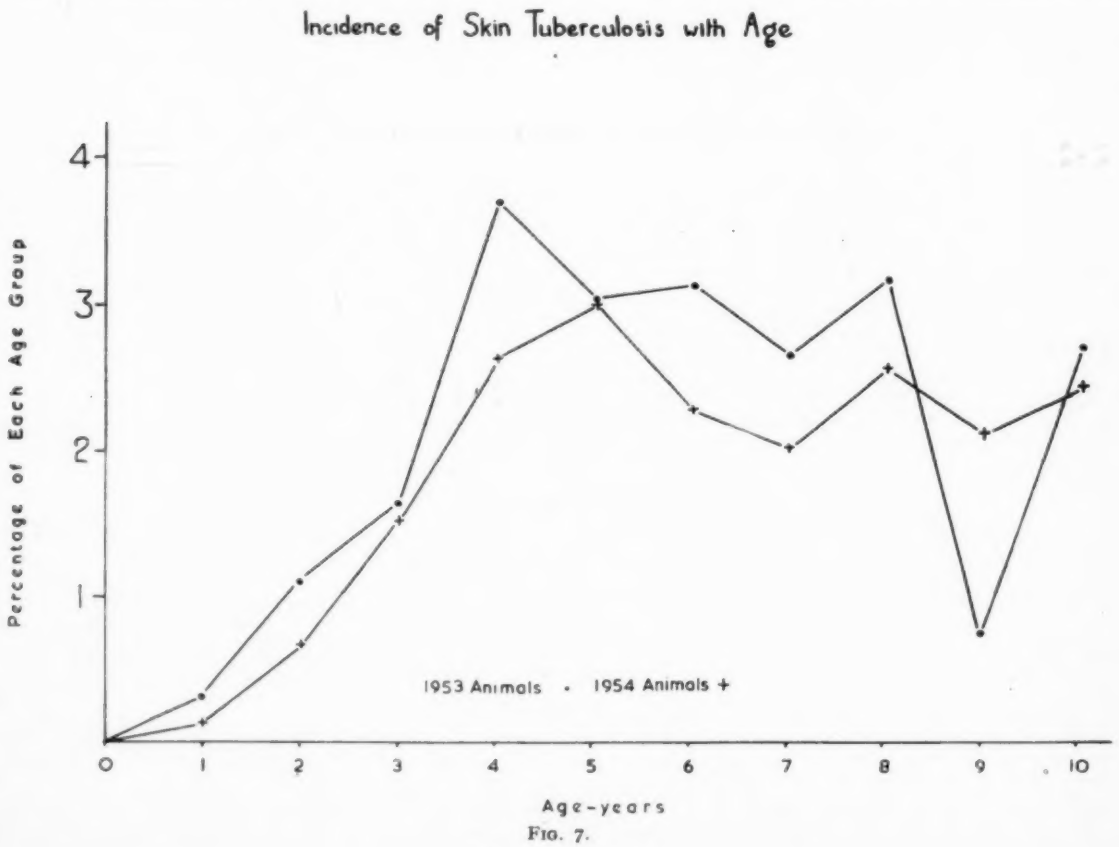


FIG. 7.

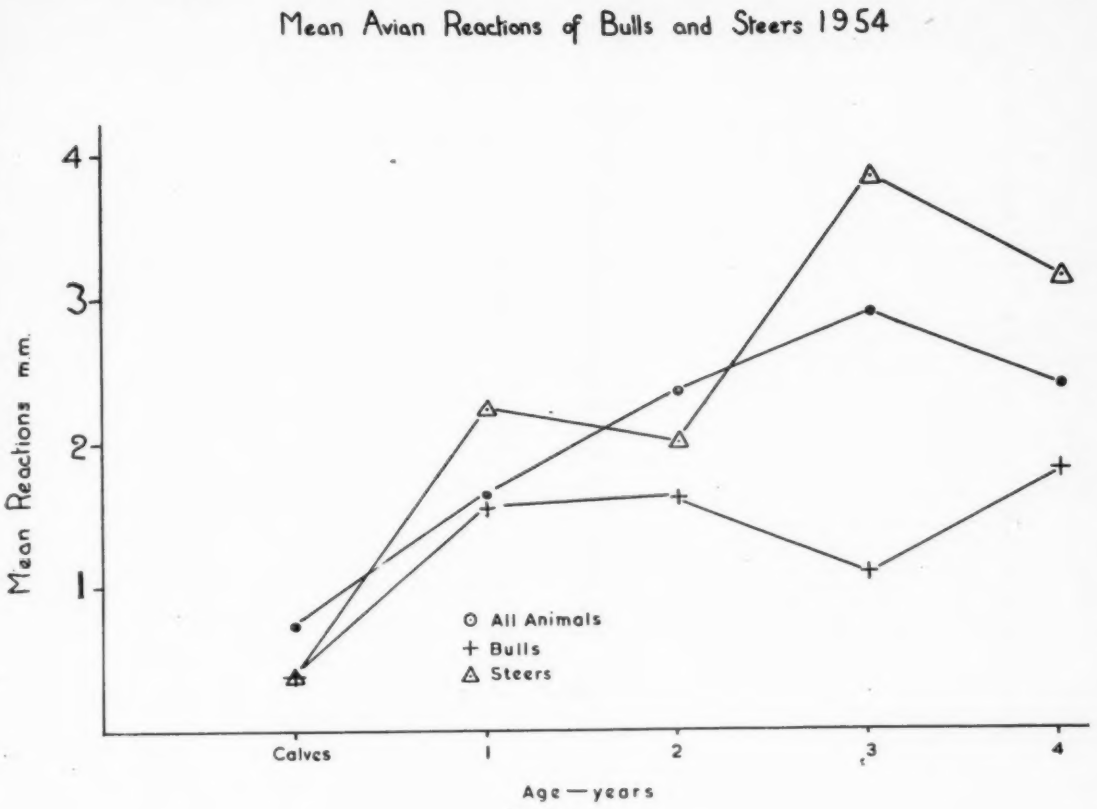


FIG. 8.

boxed area in Table IV which ostensibly present the greatest difficulty. They constitute approximately 4 per cent. of the total number of animals in the sample, and if it is assumed that approximately 70 per cent. of the animals in Berkshire are free of tuberculosis and the remaining herds are assessed largely on their mammalian reactions, then just under 3 per cent. of all animals fall into the category. This is a relatively small percentage of the cattle population as a whole, but is a percentage which increases with consideration of the age of animal, type of herd and degree of attestation. The word "ostensibly" has been used in connection with this group because although it is the strong double-positive animal which attracts most attention, the animal which causes the break-down or delays attestation may well be the one which is only tested at periods of minimum allergy and escapes detection.

## Discussion

While little difficulty was encountered in the extraction of the figures, the order of operations led to some repetition in rearrangements, largely because of lack of

TABLE IV
THE RELATIVE REACTIONS TO AVIAN AND MAMMALIAN PPD

| Mammalian increase : | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10+ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Avian more than 2 mm. more than mammalian ... ... ... | 2·06 | 3·44 | 3·01 | 2·24 | 1·66 | 1·45 | 0·94 | 0·51 | 0·40 | 0·31 | 0·72 |
| " = 2 mm. more than mammalian | 2·35 | 2·11 | 0·85 | 0·48 | 0·35 | 0·22 | 0·17 | 0·013 | 0·026 | 0·013 | 0·026 |
| " = 1 " " | 5·15 | 2·85 | 0·98 | 0·63 | 0·36 | 0·31 | 0·18 | 0·06 | 0·04 | 0·026 | 0·026 |
| " = Mammalian ... ... ... | 43·8 | 12·3 | 2·18 | 0·72 | 0·64 | 0·46 | 0·26 | 0·18 | 0·09 | 0·04 | 0·026 |
| Mammalian = 1 mm. more than avian | — | 1·72 | 0·47 | 0·33 | 0·25 | 0·30 | 0·18 | 0·14 | 0·06 | 0·026 | 0·04 |
| " = 2 " " | — | — | 0·17 | 0·16 | 0·06 | 0·13 | 0·09 | 0·21 | 0·10 | 0·04 | 0·04 |
| " more than 2 mm. more than avian ... ... ... ... | — | — | — | 0·06 | 0·10 | 0·06 | 0·13 | 0·10 | 0·06 | 0·05 | 0·182 |

(Figures represent percentages of all animals in 1954 tests.)

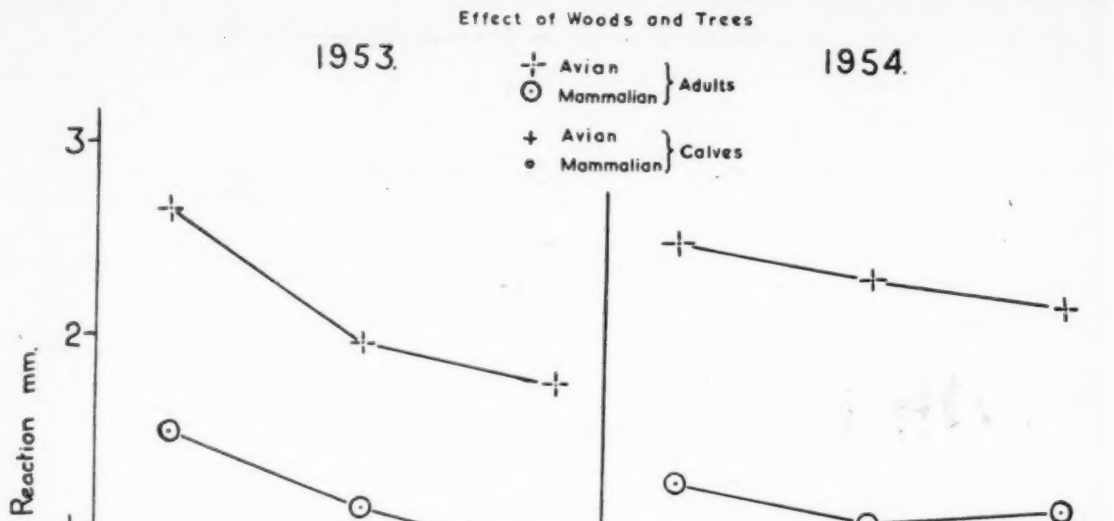


FIG. 9.

experience. Further extraction could be performed in about half the time, and rearrangements would be facilitated by the use of an indexing system. Provided the plan of attack is clear, and unnecessary time-consuming arrangements are avoided, the information presented can be compiled in about two months by two individuals.

All the rearrangements have been simple in type, and elementary statistics such as standard deviation and correlation coefficient have been included only to serve as a guide in future investigations and to avoid unwarranted conclusions. Some considerable thought had to be given to the terms in which the data were arranged; that is, whether on the basis of reaction levels or number of reactors. The former was chosen because a mean, together with its standard deviation and number of animals, appeared to give the greatest amount of information. Curves prepared from the number or percentage of reactors were generally avoided because different criteria of the positive reaction led to marked changes in level, and occasionally in shape, of the curves. For similar reasons any "official interpretation" was discarded in favour of the basic measure of increase in skin thickness expressed in millimetres.

The similarity of the graphical forms and of the means in the two successive years suggest that the samples taken may be regarded as representative of milking herds in the area; but in geographical arrangements involving herd means, larger herd samples would be required to confirm the demonstrated trends. If work

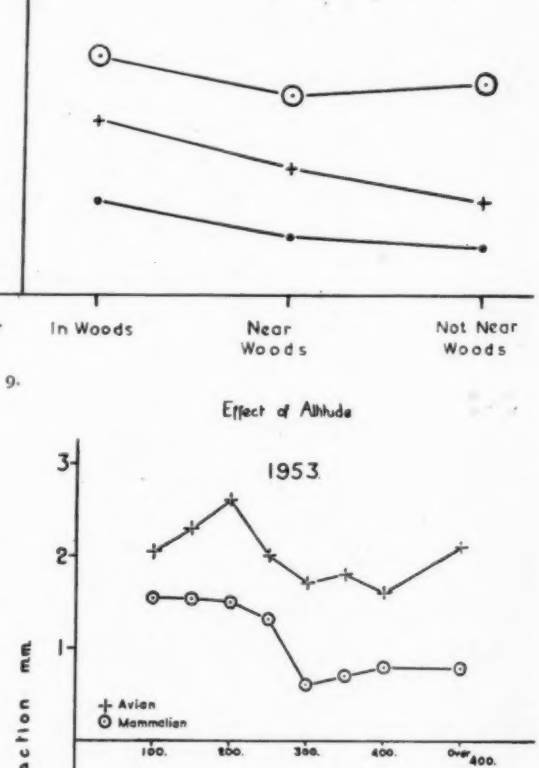


FIG. 10.

of this type were being planned it would clearly be preferable to arrange that tests be carried out by individuals with a standardised technique ; but the clear patterns emerging suggest that idiosyncrasies can be swamped by the use of large samples. The ultimate validity of the graphs obtained can only be estimated by further work directed on particular areas or on particular points of interest, but up to the present there is little evidence that the use of existing data would lead to faulty conclusions. By simple inspection and by methods similar to the use of correlation coefficients in Section 1, it would not be difficult to ascertain and segregate tests exhibiting marked individual bias.

The avoidance of any form of questionnaire, the use of random samples, and the nature of the data are all of assistance in securing an unbiased picture, uncomplicated by preconceived ideas on its origin, of tuberculin sensitivity in attested herds. All the information used was available in the test record of the herd, or could be determined from maps ; the sole exception being the location of 17 farms, for which the aid of Reading Divisional Office was required.

The different arrangements possible have not been by any means exhausted in this presentation, which has been carried out with limited means on a limited scale. The method itself could clearly be applied with profit to such questions as the effect of repeated testing or the precise incidence of particular types of problem animal.

Some opinions have been ventured in the text on the meaning of the patterns obtained. It should be stressed, however, that the existence of a correlation does not necessarily imply a causal relationship. To those familiar with the tuberculin test, few of the facts are wholly new : nevertheless, the figures and diagrams present a quantitative picture of tuberculin sensitivity in absence of tuberculosis which should be of value in discussion and in providing a framework for ideas.

*Acknowledgments.*—To the Chief Veterinary Officer, for permission to use existing data, to the Director, Veterinary Laboratory, for advice and permission to publish, to Mr. W. D. Macrae, S.V.O., for assistance in sampling, to Mr. F. B. Leech, Rothamsted Experimental Station, Harpenden, for much statistical discussion, and to Messrs. Chas. Griffin & Co. Ltd. for permission to quote from Dr. Yates' book.

**References**

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WHO Tuberculosis Research Office. (1955). **22**. 63–83.

YATES, F. (1949). "Sampling Methods for Censuses and Surveys." pp. 128–129. Chas. Griffin & Co., Ltd., 42 Drury Lane, London.

## DR. JAMES STEWART

As we go to press we learn, with great regret, of the death in Edinburgh on December 26th, of Dr. James Stewart, biochemist to the Animal Diseases Research Association. Dr. Stewart had many friends in the profession, and we hope to publish a memoir at an early date.

# Current Literature

### ABSTRACT

**Effects of Experimental Hypothermia on Vital Organs.** KNOCKER, PHYLLIS. (1955). *Lancet*, October 22nd, 1955. 837-840. 16 coloured plates.

For years cardiologists had been searching for safe ways of shutting off the circulation during heart surgery. With the advent of hypothermia it appeared that the search was at an end; instead of trying to provide the tissues with oxygen by means of an extracorporeal circulation, it should be possible to reduce the oxygen requirements of the cells to a minimum by cooling. It was thought that the cooled tissues, needing little or no oxygen, would not suffer during the period of circulatory arrest occasioned by temporary occlusion of the venae cavae. But despite the theoretical promise of hypothermia, a strong impression is gained from the literature that the whole technique, comprising hypothermia, vena-caval occlusion, and subsequently re-warming, is uncertain and hazardous. In 1954 it was reported that rapid extracorporeal cooling in dogs resulted in several deaths during the warming stage, despite various efforts to halt their downhill course. Though accepted opinion is that no gross alterations in tissue structure can be ascribed to the effects of refrigeration, it seems likely that delicate changes in the cell must take place. The present investigation was undertaken to determine whether any histochemical changes during hypothermia could be demonstrated. The investigation was conducted with 30 dogs of either sex, eight of them acting as controls. All were mongrels of about 40 lb. weight and in a general appearance of good health. In the early experiments cooling was continued until death supervened, the aim being to discover the type of cell damage. The knowledge gained was used in a search for similar changes in animals cooled only to the point where cardiac surgery is normally undertaken—*i.e.*, when the arterial blood and the venous blood are identical in colour denoting that the cooled tissues are utilising the minimum of oxygen. This is regarded as the ideal time for circulatory arrest and is usually about 25° C. (77° F.).

In this series of hypothermic dogs, the chief changes were accumulation of fat in the liver, kidney and adrenal glands; depletion of glycogen in the liver; and vacuolation of the granular cells of the zona reticularis of the adrenal cortex. The implications of these delicate histochemical changes may well be extensive. The cell changes resulting from hypothermia closely resemble those reported by other workers as resulting from various forms of stress and are perhaps attributable to tissue anoxia. If, as seems likely, they may readily become irreversible, this would account for some hitherto unexplained deaths of animals during experimental hypothermia.

G. F. B.

# News and Comment

## CONFERENCE ON INFERTILITY

A well-attended farmers' conference on infertility in cattle, arranged by the Animal Health Division and the County Agricultural Executive Committees of Caernarvon and Anglesey, was held at the University College of North Wales, Bangor on December 16th. The chairman was Mr. W. S. Jones, chairman of the Welsh Committee of the National Farmers' Union, who, incidentally, was a member of the delegation which visited the Soviet Union recently.

After a brief introductory statement by Mr. W. T. Rowlands, Veterinary Investigation Officer, Bangor, a most interesting address was delivered by Professor J. G. Wright, Dean of the Faculty of Veterinary Science, University of Liverpool, who stressed the importance of animal husbandry and herdmanship in the prevention of many of the problems of infertility.

A discussion, contributed to by many of the veterinary surgeons present, was opened by Mr. D. Lornie, Officer in Charge, Milk Marketing Board Cattle Breeding Centre, Llangefni, who has expert knowledge concerning fertility among herds in the two counties. Summing up the conference, Mr. Ll. Harry, Director, N.A.A.S. (Wales), said that he regarded it as the best of its kind he had ever attended. He was impressed, as never before, by the part to be played by herdsmen in the prevention of many kinds of infertility. He felt that no speaker had ever made this matter more clear than Professor Wright.

## THE PROCEEDINGS OF CONGRESS

We continue to have requests for additional copies of these Proceedings. We regret to state, however, that owing to the heavy cost of this volume only a limited extra supply was ordered and this has now become exhausted.

## R.C.V.S. DECEMBER EXAMINATION RESULTS

### London

**Third Examination**

*Hygiene only*

Cullinane, J. A.; Howse, J. N.; May, J. N. T.

*Pathology only*

Baker, K. P.; Bousfield, W. E. D.; Cameron, R. S.; Cocks, Edwin; Davies, Miss G. M.; Giles, H. G.; Greenwood, Ronald; Holland, William; Likar, Ivan; McKie, Miss E. M. C. E.; Nettleton, L. B.; Oakley, G. A.; Osman, B. D.; Pearce, J. S.; Robbins, G. R.; Volrath, J. P.; Wells, B. T.

**Final Examination**

Beddows, A. C. L.; Davies, M. G.; Fairhall, D. C.; Fenton, B. K.; Gray, C. G.; Hardwick, A. G.; Melluish, H. K.; Miller, J. A.; Morath, D. E.; Peters, J. B.; Pigott, R. C. C.; Pocock, E. W.; Prole, J. H. B.; Strang, R. D.; Sutton, J. B.; Watson, Miss D. P.; White, Frederick; Woollett, W. G. W. A.; Wright, M. A.

### Liverpool

**Third Examination**

*Pathology only*

Gill, W. M.

### Edinburgh

**Third Examination**

Dodson, G. R.

**Fourth Examination**

Beech, J. A.; Brown, Miss D. D.; Brunton, A. S.; Clark, James; Cribb, P. H.; Easingwold, D. E.; Gyi, K. K.; Harkness, Michael; Howells, G. J.; Kettles, A. S.; Leitch, I. D. C. M.; McDougall, G. M.; Smith, P. J.; Stone, M. W.; Stretch, I. L.; Walker, W. D.

**Final Examination**

Cuthbertson, J. L. H.; Gripper, J. N.; Howell, G. J. R.; Kay, H. R. M.; Kirkbride, L. M.; McKenzie, R. M.; McKinlay, D. I.; Murphy, O. M. G.; Prior, J. G.; Ramachandran, P. K.; Weaver, A. D.; Williams, G. L.

### Glasgow

**Fourth Examination**

Carrigan, T. D.

## FOOT-AND-MOUTH DISEASE

In an Order dated December 19th, the area described below was declared to be an Infected Area for the purpose of preventing the spread of foot-and-mouth disease. The area comprises:—

*In the County of Kent*—The city of Rochester; the boroughs of Chatham, Gillingham and Gravesend; the Petty Sessional Division of North Aylesford.

*Petty Sessional Division of Dartford*, the parishes of Swanscombe and Southfleet.

*Petty Sessional Division of Bearsted*, the parish of Bredhurst and so much of the parishes of Boxley and Detling as lies to the north and west of the main road A.249 running from Maidstone to Sheerness excluding the said road.

*Petty Sessional Division of Sittingbourne*, the parishes of Upchurch, Lower Halstow and Hartlip and so much of the parishes of Newington, Borden, Bobbing, Sittingbourne and Milton and Iwade as lies to the north and west of the main road A.249 running from Maidstone to Sheerness excluding the said road.

*Petty Sessional Division of Malling*, the parishes of Snodland and Burham and so much of the parish of Aylesford as lies to the north of the road B.2011 running from Ditton *via* Aylesford to Sandling including the said road.

The area described in the Schedule below will cease to be an Infected Area for the purpose of preventing the spread of foot-and-mouth disease on January 7th, 1956.

*County of Leicester—Petty Sessional Division of Belvoir,* the parish of Bottesford.

*County of Lincoln (parts of Kesteven)—Petty Sessional Division of Spitalgate,* the parish of Long Bennington and so much of the parish of Westborough and Dry Doddington as lies to the south and west of the road running from Claypole *via* Dry Doddington to Hougham excluding the said road.

*County of Nottingham*—The Borough of Newark.

*Petty Sessional Division of Bingham,* the parishes of Flintham, Kneeton, Screveton, East Bridgford, Car Colston, Hawksworth, Thoroton, Orston, Aslockton, Scarrington, Elton, Granby and Whatton and so much of the parish of Bingham as lies to the north and east of the railway running from Nottingham *via* Bingham Road Station to Melton Mowbray excluding the said railway.

*Petty Sessional Division of Newark,* the parishes of Rolleston, Farndon, Hawton, Balderton, Cotham, Thorpe, East Stoke, Elston, Syerston, Sibthorpe, Shelton, Flawborough, Staunton, Alverton and Kilvington.

*Petty Sessional Division of Southwell,* the parish of Hoveringham and so much of the parishes of Fiskerton cum Morton, Bleasby and Thurgarton as lies to the south and east of the railway running from Newark *via* Fiskerton Station to Nottingham excluding the said railway.

## THE STEELE-BODGER MEMORIAL PRIZE

This Prize was created by the fund established in 1953 to perpetuate the memory of the late Harry Steele-Bodger. It takes the form of a travelling scholarship, or a contribution to a tour abroad, and is to be awarded at least once in every four years.

Members of the Royal College of Veterinary Surgeons are eligible; together with final year students of any of the university veterinary schools in the United Kingdom and Eire.

Further particulars may be obtained from the General Secretary of the B.V.A.

## VETERINARY EXAMINATION AT CHAMPIONSHIP SHOWS

We publish below, by permission of The Kennel Club, extracts from a letter recently circulated to their members on the subject of veterinary examination and the amenities to be provided at Championship shows for veterinary surgeons:—

Kennel Club Show Regulation 16 states that the show committee personally, or by their authorised manager of a show shall provide a suitable place in which dogs suspected of contagious or infectious disease can be properly isolated from the rest of the show. A section of benching should be erected in the proximity of, but not out of sight of, the veterinary inspection point, so that dogs which are rejected or put back for further examination can be placed there under the supervision of the veterinary steward. A separate veterinary inspection bench or ramp should be provided for each veterinary surgeon officiating.

Kennel Club Show Regulation 3 requires that bowls containing disinfectant and soap and water shall be provided at all entrances for dogs. A towel should also be provided with each bowl and it is suggested that the bottle of disinfectant should be left with the bowl so that the veterinary surgeon may add this to the water, if he wishes. Kennel Club Show Regulation 3 requires that a steward shall be appointed to assist each veterinary surgeon who is officiating.

The veterinary surgeons should always be provided with a room, or a tent in the case of an open-air show. It is essential that there should be a place in which veterinary surgeons can safely leave their cases of drugs and instruments, and also where they can examine any dogs brought to them during the show. A responsible person should always be left on duty in this place so that he may summon a veterinary surgeon with the least possible delay when the occasion arises.

Every show should also have a book of veterinary certificates which when signed by one of the official veterinary surgeons will permit an exhibit to be removed from the show immediately.

The letter concludes: The Committee fully appreciates that some shows already make a point of providing good accommodation for veterinary surgeons, but from reports which have been received it is obvious that there is room for improvement in many cases.

## PERSONAL

### Birth

NICOL.—On November 28th, 1955, at St. Mary's Hospital, Manchester, to Barbara J. Nicol (*née* Barlow), M.R.C.V.S., wife of Dr. Alexander Nicol, a son, Peter Gordon.

## COMING EVENTS

### January, 1956

5th (Thurs.). General Meeting of the Central Division, B.V.A., at the Royal Veterinary College, Camden Town, N.W.1, 6 p.m.

6th (Fri.). Annual Dinner and Dance of the North Wales Division, B.V.A., in the Imperial Hotel, Llandudno, 7 p.m.

Sixteenth Ordinary General Meeting of the A.V.T. and R.W.s at the Royal Veterinary College, Camden Town, N.W.1, 10 a.m.

11th (Wed.). General Meeting of the Lancashire Division, B.V.A., at the Queen Hotel, City Road, Chester, 2.30 p.m.

### February

**3rd (Fri.). Meeting of the Technical Development Committee, B.V.A., at 7, Mansfield Street, Portland Place, London, W.1, 10.30 a.m., to receive further articles on calf diseases.**

10th (Fri.). Annual Ball of the Glasgow University Veterinary Medical Association in the Rhul Restaurant, Sauchihall Street.

17th (Fri.). Annual Ball of the Royal (Dick) School of Veterinary Studies in the Assembly Rooms, George Street, Edinburgh, 8.30 p.m.

22nd (Wed.). Second Meeting of the A.V.T. and R.W's. Scottish Regional Group for the 1955-56 session in the Moredun Institute, Edinburgh, 2.15 p.m.

## B.V.A. COUNCIL AND COMMITTEE MEETINGS IN LONDON

*Wednesday, January 18th*, 1956

10.30 a.m.—Home Appointments Committee, at 7, Mansfield Street, W.1.

12.00 noon—Parliamentary and Public Relations Committee at 7, Mansfield Street, W.1.

2.15 p.m.—Organising Committee, at 7, Mansfield Street, W.1.

*Thursday, January 19th*, 1956.

10.00 a.m.—Veterinary State Medicine Committee, at 7, Mansfield Street, W.1.

12.00 noon—Finance Sub-committee, at 7, Mansfield Street, W.1.

2.15 p.m. General Purposes and Finance Committee, at 7, Mansfield Street, W.1.

*Friday, January 20th* 1956.

10.30 a.m.—Meeting of Council at Connaught Rooms, Great Queen Street, W.C.2.

## ADDRESSES OF DISEASE INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

### Anthrax

*Angus*. Flemington Farm, Aberlemno, Forfar (Dec. 19).

*Derby*. Crow Tree Farm, Off Ford Lane, Willington (Dec. 16); Old Hall Farm, Swarkestone (Dec. 19).

*Flints*. Plas Capten Farm, Newmarket, Dyserth (Dec. 17); Bodlondeb Farm, Mostyn Road, Greenfield, Holywell (Dec. 19).

*Yorks*. Scamer Hill, Stokesley, Middlesbrough (Dec. 19).

### Foot-and-Mouth Disease

*Kent*. Cooling Castle Marshes, Cooling (Dec. 19).

### Fowl Pest

*Brecon*. Lower Wenallt, Talybont-on-Usk; St. Helena, Well Street, Bryn Mawr; Phillips Field, Cross Roads, Gilwern; Cross Roads, Middle Common, Gilwern (Dec. 16); Tyfry, Cwmdu, Crickhowell (Dec. 17); Cefn Machllys, Talachddu; Ty Mawr, Crickhowell; Gellitarm, Llwydcoed, Aberdare (Dec. 18); Tynwern, Gilwern (Dec. 20).

*Bucks*. 19, Mill Road, Slapton, Leighton Buzzard (Dec. 17).

*Carmarthen*. Drysgolgoch, Conwyl Elfed (Dec. 17); Tycock, Dryslwn; Blaengwyddgrug, New Inn, Pencader (Dec. 18); Maesglas, Saron, Ammanford (Dec. 19); 2, Llyndu Villa, Glanamman, Ammanford; Tenybank, Nantgoredig; Iscoed Farm, Whitland; 17, Tabernacle Road, Glanamman, Ammanford (Dec. 20).

*Essex*. 5, Ravens Wood Chase, Rochford; Cloyna Poultry Farm, Stock, Ingatestone (Dec. 17); 18, Straight Road, Boxted, Colchester (Dec. 18); Stock Farm, Stock, Ingatestone; Southdowns, Langham Road, Boxted (Dec. 20).

*Glamorgan*. Bryngwyn Farm, Kingsbridge, Gorseinon, Swansea; 21, Pleasant View, Tirphil, New Tredegar; Malpas Bungalow, Ponty-Gwyndy Road, Caerphilly (Dec. 16); Old Malsters, Bridge Street, Pontypridd; Cefn Brithdir Farm, Tirphil, New Tredegar; 17, Ash Grove, Cimla, Neath (Dec. 17); 11, The Grove, Rumney (Dec. 19).

*Gloucester*. The Bungalow, Cold Aston Road, Bourton-on-the-Water, Cheltenham (Dec. 20).

*Hereford*. The Rectory, Dorstone (Dec. 16); Goldon Post, Allensmore (Dec. 17); The Thorne, Weobley and The Dark Orchard, Weobley (Dec. 20).

*Lancs*. Studley House, Liverpool Road, Longton, Preston (Dec. 16); Moss Farm, Marsh Lane, Longton (Dec. 19).

*Leics*. Upper House, Great Bowden, Market Harborough (Dec. 19).

*Monmouth*. Pear Tree Cottage, Marshfield, Cardiff; No. 2, Holding, Cadvor, Govilon, Abergavenny; Sunnybank House, Slovad Road, Panteg, Pontypool (Dec. 16); Cwmywiwr Farm, Usk Road, Caerleon, Newport; Bowers Farm, Grosmont; Lower Bungalow, Capel-y-Sffin, Llanthony, Abergavenny (Dec. 17); Hill Farm, Trostrey, Usk (Dec. 18); 12, Gilboa Road, Newbridge, Newport (Dec. 19); Hereford Road Garage, Abergavenny; Cwmbrynar Farm, Pontillanfraith, Blackwood (Dec. 20).

*Norfolk*. Chapel Lane, Foulsham, Dereham; Gigantea House, Thorford, Fakenham; Seething House Cottage, Seething, Norwich (Dec. 16); Dove House Farm, Tibenham, Norwich; Dysons Farm, Tibenham, Norwich (Dec. 17); Perrys Allotment, Marsh Road, Great Yarmouth (Dec. 18); Linghall Cottages, Wood Norton, Dereham; Ferriers Allotments, Cobholm, Great Yarmouth; 105, Mill Road, Great Yarmouth (Dec. 20).

*Staffs*. Little Bank Farm, Broughton, Claverley, Wolverhampton (Dec. 16).

*Sussex*. Mayfield Farm, Hollington, St. Leonards (Dec. 16); The Farm Beach, Rye Harbour, Rye; Whitehouse Farm, Waldron, Heathfield; Yew Tree Cottage, Icklesham, Winchelsea (Dec. 17).

### Swine Fever

*Cambs*. Whittlesby Road, March (Dec. 19); Home Farm, Heydon, Royston (Dec. 21).

*Ches*. Five Oaks, Newmans Lane, Stapeley, Nantwich (Dec. 19).

*Devon*. Grange Home Farm, Broadhembury, Honiton (Dec. 22).

*Hants*. 147, Broadway Lane, Bournemouth (Dec. 19).

*Lancs*. Tonge Bottom Farm, Ashton-under-Lyne (Dec. 19).

*Yorks*. Pioneer Farm, Linthwaite, Slaithwaite (Dec. 21).

*Staffs*. Piggeries off Cannock Wood Street, Hazel Slade, Cannock (Dec. 19).